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PESTICIDE CONTAINER RECYCLING FACILITY

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PESTICIDE CONTAINER RECYCLING FACILITY

Report prepared for:

Waste Management Branch
Ontario Ministry of the Environment

Report prepared by:

Future Farm Supplies (1980) Ltd.

OCTOBER 1992

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PESTICIDE CONTAINER RECYCLING CONCEPT

The agricultural community and the pesticide industry have come to recognize that a problem exists concerning the disposal of containers that have been used to market various crop protectants. In attempting to comply with Ministry of Environment regulations farmers have met with resistance from landfill sites refusing to accept containers that have previously held pesticides. The problem is especially acute for steel drums which have been used extensively in this region for tobacco industry products. Many farmers are faced with the challenge of disposing of these drums but had no place to take them. The result of this was that empty drums were left on the farm or thrown into gullies and waterways, posing a risk to our health and to our environment.

In looking for a solution to this problem it was felt that the drums could be reclaimed and recycled. A centrally located depot is now available to collect these containers and then prepare them for safe recycling. Many drums contain poisons that do not allow for refilling once they have been used. In order to ensure safe reuse the only logical alternative is to recycle the steel drums by melting them. However before this can be done any chemical residues must be safely removed. The drums can then be crushed for economic transport to purchasers of scrap metal.

Future Farm Supplies objective was to provide the site for such a facility to respond to the needs of: farmers who are looking for a safe place to dispose of containers; suppliers in the pesticide industry who wish to accept their responsibility for ensuring the safe use of their products; government organizations who wish to ensure that farmers are able to comply with the regulations in force concerning disposal of pesticide containers; and the general public concerned about the effects of improper disposal of these materials.

Through a grant from the Ministry of the Environment's Industrial Waste Diversion Program we were able to meet this objective and now have a first class facility to handle this potential environmental problem. We have put over 12,000 barrels through this new facility and have negotiated two contracts with chemical manufacturers to provide some ongoing financial support for the project in an attempt to make the operation economically viable. We still have a long way to go and the plant is certainly not running at capacity at this time.

DETAILS OF OPERATION

The initial thrust of the operation was aimed at tobacco fumigant and sucker control drums. An estimate was made by Bruce Abbey of Nor-Am Chemicals, Craig Hunter of OMAF and Mike Perovich of the number of drums that are stockpiled and/or recoverable. It was estimated that there were about 250,000 drums that have been produced in the past ten years for commonly used products in Ontario, not including 20 litre pails. Most of these containers could be recovered and disposed of properly using this facility.

As outlined in our initial proposal to the Ministry of the Environment, the drums can be brought to the recycling plant in two ways:

- farmers can return the drums themselves directly to Future Farm Supplies; or,

- Future Farm Supplies can pick up drums on return trips from various farm supply outlets which they now service.

This latter option permits the farmer to return the drums to the original place of purchase, making it very convenient for them. The area covered at present includes all of the tobacco district where the majority of these drums are being used. Most outlets would have deliveries at least twice each year when drums can be picked up but if a substantial number were collected during the slow season these might be picked up by special order.

Each drum brought in is inspected to determine the type of product it contained and if there is any residue. This is usually apparent by reading the label and visually inspecting the contents. Our familiarity with most of these products makes this job easier but if there is any question as to the contents of the drum we send samples in to a qualified lab for verification. Tobacco fumigant barrels that show any signs of residue are stored in a designated area until all the chemical has safely evaporated.

This initial stage requires safety equipment to protect those handling the barrels and a special high powered air ventilation system in the storage area where the fumigant is evaporating. There is no need to collect the fumes as the air exchange in the entire building is so rapid that the air quality is better than legislated standards.

Barrels that are ready for crushing are transported by lift-truck from the unloading or the storage area to the crushing unit. Here they are placed upside down on a grate that has a ventilated area below it to remove any fumes that might be generated during the crushing process. The operator activates the hydraulic ram that crushes the drum down to a disk about six inches high. Another mechanical arm then pushes the puck onto the conveyor belt that deposits it in the dump-trailer. Safety features are built into the crusher unit such as gates that close before the crusher can be started, preventing possible injury to the operator.

As soon as a full load of crushed drums is obtained it is transported to a scrap metal dealer. We have two purchasers that willingly buy the crushed drums.

The design of the plant includes an unloading dock, storage space for 8000 drums, the crusher unit and a conveyor system.

THE PROJECT

IMPLEMENTATION:

Significant effort was required prior to starting the project. We spent hours securing assistance from the Ministry of the Environment in both financial and knowledge areas. We worked closely with both the Ministry of Labour and the Ministry of the Environment when designing the equipment and facility specifications. The manufacturer of the barrel crusher was also consulted on an ongoing basis.

To ensure the ongoing financial feasibility of the project, countless hours were also spent securing contracts with the chemical manufacturers and ensuring an end purchaser of the crushed barrels, i.e. a scrap metal dealer.

Once these were in place we then proceeded to obtain quotes on various aspects of the project. Because of the unique requirements of this facility there were a limited number of people willing to undertake this challenge and required significant input and monitoring by both Mike Perovich and the various Ministry representatives.

INSTALLATION:

Retrofitting the Building - Installation of ventilation, insulation, heating and special electrical circuitry to meet the Ministry of Labour's safety and health requirements became the first priority. During this stage, the manufacturer of the barrel crusher, Tripp-Vogt-Trottier Ltd., commenced work on the crusher. Through careful planning and coordination, all aspects of the project ran smoothly until we reached the testing stage. The barrel crusher was initially unable to crush the barrels to the required 6" puck size. After some modification this was rectified and the facility was available for inspection by both the Ministry of Environment and Ministry of Labour. Both Ministries agreed the plant met all present requirements which was made possible through the close liaison by Mr. Perovich with all government representatives and these representatives willingness to cooperate.

TECHNICAL ASPECTS:

The proper ventilation required that the air exchange rate be as high as once every four minutes for the entire building. The electrical system had to meet an explosion proof environment which required special wiring, light fixtures and switches. Safety of the employees was the number one consideration in the design of both the building and the equipment. Safety procedures are in place and all the most advanced safety equipment is available for the employees' protection.

The barrel crusher compacts barrels to 6" pucks and pushes them onto a conveyor system which automatically carries the puck to a dump trailer. The plant can crush as much as 800 barrels in a normal 8 hour day. However, most barrels must stand 7 to 10 days to prepare them prior to crushing.

It is estimated that 25,000 to 30,000 drums will be produced annually to supply the present level of demand for soil fumigants and sucker control. Increases in fruit and vegetable production in the estimated service area could push this figure still higher. This, together with the 250,000 barrel estimated backlog, is enough to keep the facility operating full time for at least 7 years. However we are presently not receiving this volume which may indicate the need to further increase awareness of this service.

Future possibilities for the recycling facility include the reclamation of plastic jugs used in the pesticide industry. The same procedures for inspection, cleaning and airing could be used before the jugs are shredded and sold to manufacturers for recycling.

The agricultural industry will continue to produce empty containers that must be disposed of. Future Farm Supplies could act as a depot to collect any materials that can be safely reused or recycled and to properly dispose of any materials that could pose an environmental risk if not handled correctly. Clearly the function of this facility could be expanded to handle future needs as well as cleaning up problems created in the past.

POSITIVE ASPECTS OF PROJECT:

All our initial objectives were met. We were able to compact the barrels to 6" pucks eventually with minimal to "Nil" vapor problems. The ventilation system exceeds our present legislative requirements for air exchange rates and we have exceeded our 800 barrel a day target capacity. The agricultural community have found accessibility convenient and easy. The metal recyclers have found the end product exceeded acceptability requirements and the Ministry of the Environment enforcement officers have been pleased with the results to date.

NEGATIVE ASPECTS OF PROJECT:

Due to the lack of similar projects, most design specifications were lacking and additional costs were incurred due to some "trial and error" procedures (learning the hard way). The most notable problem occurred with the barrel crusher which initially could not reduce the size to six inches and had to be redesigned and modified to achieve this objective.

The ventilation system has developed some water leaks during inclement weather conditions. This is presently being rectified.

The major problem however was the higher than anticipated costs and the unanticipated interest costs resulting from the delay in receiving the government assistance caused by unrealistic projections prepared by Future Farm Supplies Ltd. as to timing and our unfamiliarity with various reporting requirements of the government agencies.

COSTING:

The costs incurred in various areas of the project are outlined below:

Capital	Cost	Grant Applied
Drum crusher and conveyor	$ 50,518.00	$ 45,000.00
Explosion proof wiring & lighting	42,323.00	33,033.00
Ventilation	20,062.00	20,000.00
Safety equipment	5,267.00	5,000.00
Operating equipment	27,025.00	25,000.00
Miscellaneous (fire rating, (loading dock, etc.)	63,420.00	20,000.00
	208,615.00	148,033.00
Operating (Net of G.S.T.)		
General operating expenses	28,458.00	
Labour	35,440.00	
Administration	2,575.00	
Trucking	5,882.00	50,267.00
	72,355.00	50,267.00
	$280,970.00	**$198,300.00**

We have not tracked separately the interest cost relating to carrying the project to completion and until the government funds were received but we estimate that this figure would be approaching $20,000.

PROMOTION:

Further funds have been expended by both Future Farm Supplies (1980) Ltd. and Nor-Am Chemical Company in promoting the new facility. We have enclosed a sample hand out prepared which was mailed with our monthly statements and a sample advertisement run by Nor-Am and still being used. When the facility first came on stream six billboards were rented in the Tillsonburg, Delhi and Simcoe areas as well as advertising placed in newspapers in these and other areas.

Various interviews were granted to newspapers in the region as well as with CBC Radio and CFPL TV has been contacted in an attempt to set up an interview in the near future. We are continuing to further promote the facility together with the support of various chemical manufacturers such as Nor-Am.

RESULTS:

From May, 1991 to present, we have crushed close to 12,000 barrels. We presently have two contracts with chemical manufacturers to crush empty barrels and have realized approximately $2,000 through sale of scrap which barely offset the fuel cost of the transportation to the scrap dealers let alone the driver's wages and other related costs. Some non-agricultural barrels have also been put through the facility. These were brought to us by the Ministry of the Environment, the Ministry of Transportation of Ontario and the Ministry of natural resources. These items were processed free of charge.

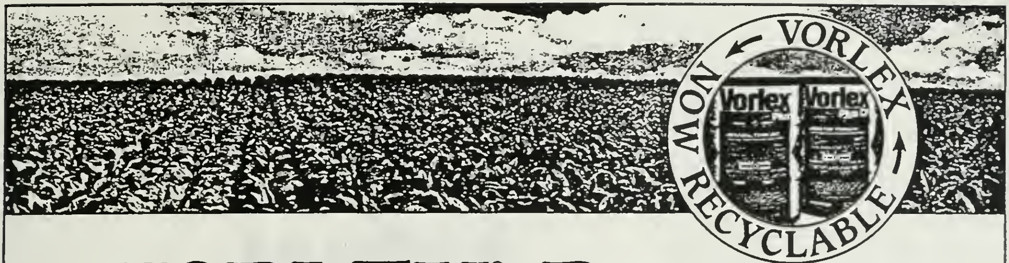
The barrel crusher specifications were upgraded to meet our initial objectives.

CONCLUSION:

The project is undercapitalized due to various cost overruns which were a result of changes made to meet our initial specifications. The project is presently operating well below break even but anticipated new contracts with chemical manufacturers in the near future will continue to advance the project towards the break even point. Future Farm Supplies contribution to the project has exceeded $100,000 to date.

More promotion by government agencies would be helpful to encourage proper environmentally safe disposal of drums, and increasing public awareness of environmental hazards of improper storage and usage of these empty chemical containers. This type of government initiative hopefully will result in higher utilization of our facility. This together with the development of companion products (i.e. plastic and cardboard recycling) would greatly increase the future viability and feasibility of the project.

For future projects, we strongly recommend extensive research of project specifications to the best of ones ability with all affected regulatory bodies (i.e. Ministry of Environment, Ministry of Labour, etc.). Automate as extensively as possible to keep labour costs to a minimum. Ensure construction costs are adequately funded so that the operational cash flow of the ongoing enterprise is not affected by the cash flow requirements of the project. In projecting cash flow, get an accurate indication of the timing of government funding. It is imperative that one work closely with the Ministry of the Environment to solicit their assistance in dealing with the other government agencies in an attempt to coordinate all aspects of the project.



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Soil fumigation with VORLEX® Plus® or Plus® CP is one of the best ways available to give your tobacco crop a clean growing environment. With soil diseases, nematodes and wireworms under control, tobacco seedlings get off to a fast, strong start… producing higher yields of quality tobacco. There are other environmental benefits to using VORLEX, too. The low application rate means you put less chemical on the ground. And now you can recycle VORLEX drums at a new container disposal site in Brownsville, Ontario. See your VORLEX dealer for complete details. VORLEX Plus and Plus CP. The right choice for a cleaner environment.

NOR-AM.

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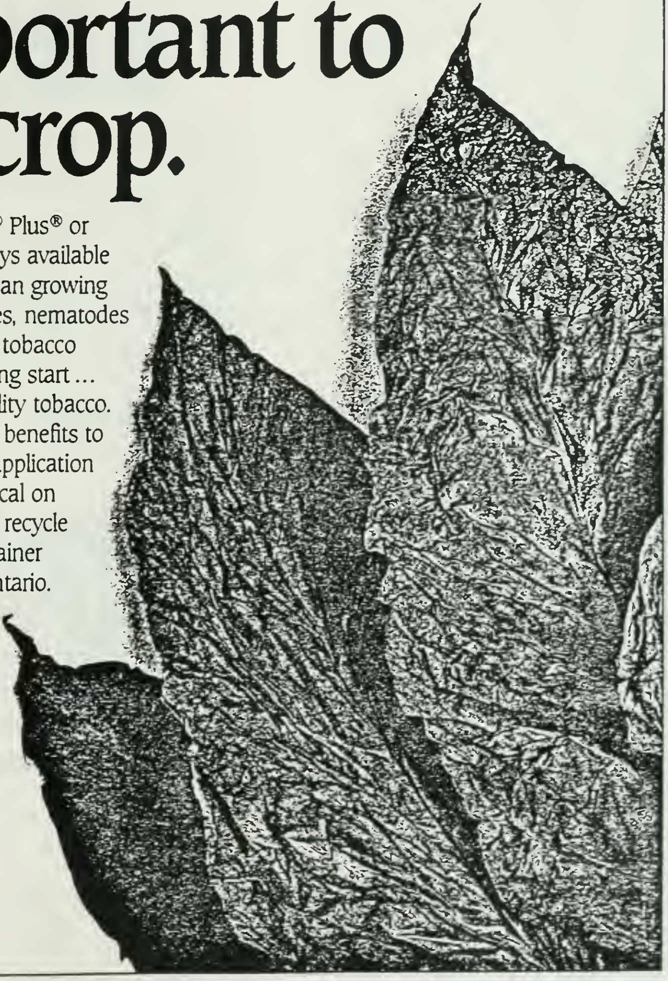

NOW RECYCLABLE

Starting in 1991, growers who apply VORLEX® Plus® or VORLEX® Plus® CP can return the empty drums to Future Farm Supply, Hwy # 3, Aylmer, Ontario for disposal.

Designed to help reduce the problem of crop protection container disposal and provide a cleaner farm environment, this facilty was completed with financial assistance from the Ontario Ministry of Environment. NOR-AM Chemical Company and United Agri Products.

For Complete Details, ask your VORLEX dealer or call 1-800-668-1783.

NOR-AM.

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